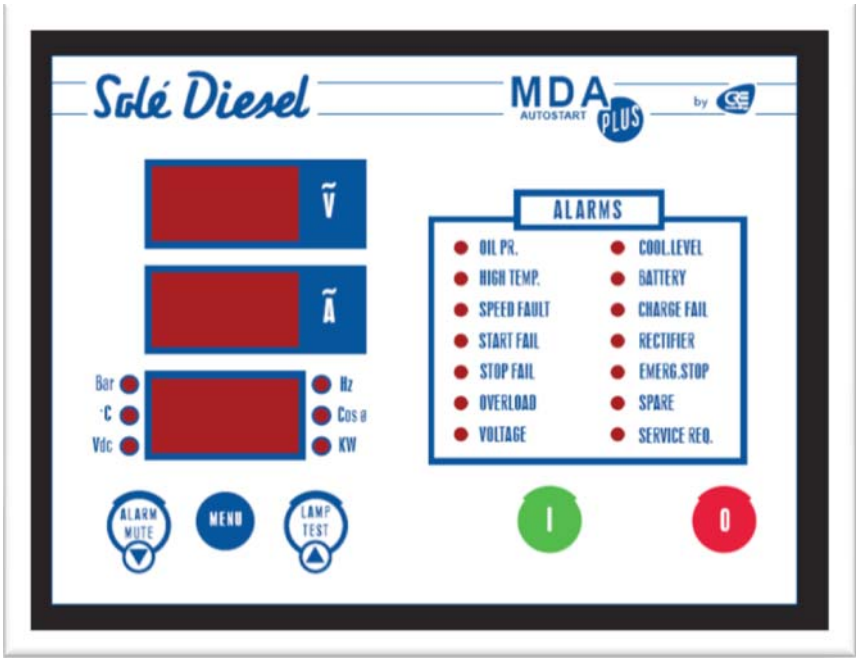
Solé Diesel

GENERATORS CONTROL PANEL



Service manual

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1. INTRODUCTION TO THE CONTROL PANEL

The unit is a control and protection panel used for generating sets/power plants; it shows the settings measured on its displays. The Unit is designed for easy use, for both installer and end-user alike. Programming is usually not necessary, given that all factory default settings have been carefully selected to properly handle the majority of applications. At all events, the programmable parameters allow complete control over the entire plant. The programmed parameters are stored in the non-volatile memory, retaining all information necessary even if there is a power cut.

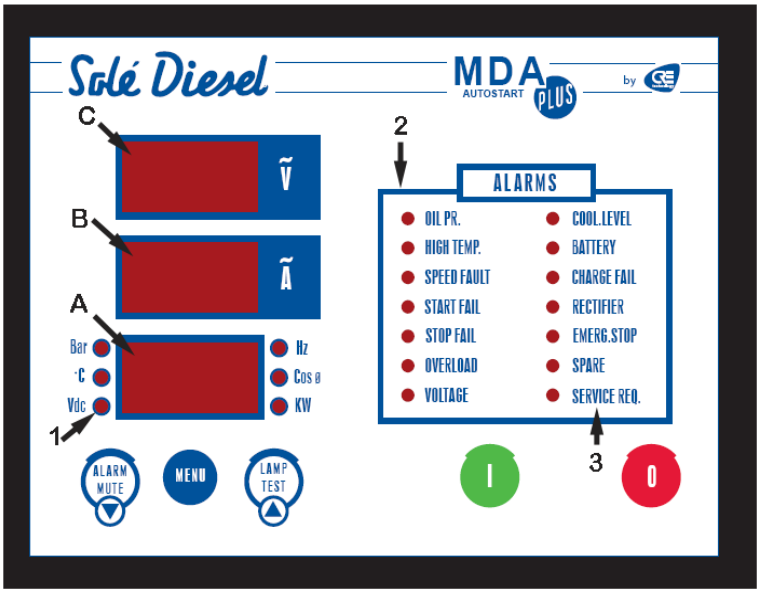
Parameters that can be displayed on Control Panel

PHASE VOLTAGES (V)	LINE VOLTAGES (V)	CURRENTS (A)*
U Phase voltage U to neutral	U – V Line voltage	U phase current
V Phase voltage to neutral	V – W Line voltage	V phase current
W Phase voltage to neutral	W – U Line voltage	W phase current

The Following parameters can also be displayed:
- Generator frequency
- Total KW of the generator*
- Total Power rating factor of the generator*
- Battery voltage
- Coolant temperature
- Oil pressure.

*In order to measure these parameters, a toroidal (current transformer) must be installed. See section 2.1 “Display B.”

2. GENERAL APPEARANCE OF PANEL



2.1. Visual elements

Display A

Display A can show the instantaneous readings of the sensors installed on the engine:
- ➔ Bar: Oil pressure (corresponds to cable).
- ➔ ºC: Temperature (corresponds to cable).
- ➔ Vdc: Alternator charging voltage (corresponds to white-red cable).

- ➔ Hz: Mains frequency, frequency of the output voltage/signal (taken after the alternator's output cables "between 2 phases").
- ➔ Cos Φ: Power factor (to display this, connect a current or toroidal transformer in at least one of the phases).
- ➔ KW: Power (to display this; connect a current or toroidal transformer in at least one of the phases).

To display parameters, press the "*Menu*" button (1 click only), and this will advance from one parameter to another correlatively; the LED corresponding to the parameter being displayed will come on.

*When the "*Menu*" button is pressed, "Display C" appears and also changes; this is not important given that we want to view the parameters of "Display A."

Display B

"Display B" displays the charging rate (when the plant is working offload, this rate is at 0). In order to call up and display this current, a current or toroidal transformer must be installed in at least 1 of the phases. To view this rate of the different phases, toggle them using the "*Menu*" button and using one click.

Current transformers are there to enable us to view a rate of a phase as well as to step-down/transform a high rate to a lower rate so that the control panel can read it (the panel accepts an input rate of 5A).

For example; in a 15kVA generator connected to 220 three-phase, the power draw rate is around 40A, therefore, we shall have to connect a transformer that is 50/5, that is from 50A output at alternator / 5A input at the control panel.

To calculate the power consumption rate of an alternator, we use:

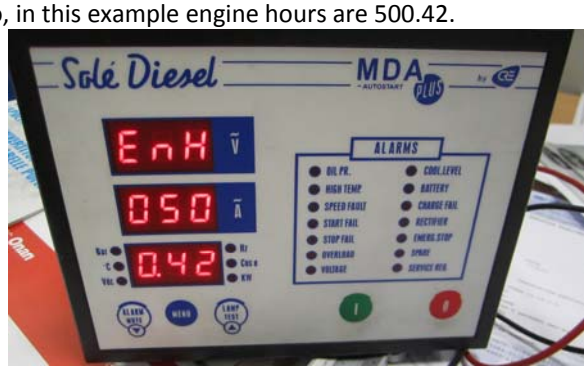
-Apparent power "S" = 15kVA (kilo Volt-Amps) = 15,000 VA

-Voltage "V" = 220V

-Rating I = S / V × √3 = 15,000 / 220 × √3 = 39.36A

The rate transformer is **not supplied by SOLÉ, given that it is an optional extra should the client wish to use this function. If said transformer is not installed, the generator plant will still work correctly, the Display, however, will show incorrect settings (0).*

There is another function for this display, it show engine operation hours number when you press MENU button, during 2 seconds. The B display number corresponds to the 3 first digits of the number of hours. The A display number corresponds to the last digit and the decimal number of hours. So, in this example engine hours are 500.42.



Display C

"Display C" can show the alternator voltages by clicking on the "*Menu*" button; whereupon it will correlatively display the L1, L2 and L3 voltages (phase voltages), and L12, L23, L31 (line voltages).

LED group "2"- Alarms and pre-alarms

These LEDs correspond to the alarms and warnings when a fault/failure occurs in the engine. When it is an alarm, the LED comes on and the engine shuts down; when it is a warning, the LED flashes and the engine does NOT stop.

ALARM	DEFINITION	POSSIBLE CAUSE (Checks to carry out)
Oil pressure	Oil pressure low	-The transmitter is faulty. -The engine is leaking oil.
High temp.	High temperature	-The transmitter is faulty. -Water inlet blocked, proper cooling is not taking place.
Speed fault	Speed failure (frequency above or below the nominal 50Hz setting for 1500rpm, and 60Hz for 1800 rpm).	-Check the fuses on the alternator panel installation. -Check that the engine rpm are correct (1500rpm, 3000rpm or 1800rpm) -Check the frequency of the signal by measuring it with a multimeter directly at the alternator's output. -Check the programmed alarm's frequency.*
Start fail	The plant does not start.	-Check no alarms are active.
Stop fail	The plant does not stop.	-Check that the electrical installation and configuration are suitable for the engine stop type: ETS or ETR.*
Overload	Overload (excess of power demand; the toroidal transformers are needed to measure the power level).	-The charge is asking for more power than the plant can deliver. The toroidal transformers are not installed at SOLÉ, hence this alarm is deactivated by default.
Voltage	Too high-voltage or too low-voltage	- Check the fuses on the alternator panel installation. -Check that the engine rpm are correct (1500rpm, 3000rpm or 1800rpm) -Check the voltage of the signal by measuring it with a multimeter directly at the alternator's output. -Check the programmed alarm's frequency.*
Cool. level	Low coolant level	-Coolant level too low. The transmitter is not installed at SOLÉ, hence this alarm is deactivated by default.
Battery	The battery is flat	-The battery has discharged.
Charge fail	Alternator failure, not charging the battery properly.	-Check the engine running speed, and that the belt driving the alternator is properly tensioned.
Rectifier	Rectifier failure.	Not installed.
Emer. Stop	Activated when the plant has an Emergency Stop mushroom button fitted.	Not installed.
Spare	This LED is spare for us to install an external alarm.	-------
Service req.	Maintenance time.	Comes on when the scheduled maintenance interval exceeds the limit.

*To check or change a configuration parameter, see section 5 PROGRAMMING OF VARIABLES.

2.2. Panel's buttons

BUTTON	FUNCTION
	The MENU button enables movement through the different menus found on the control panel: • Just one click enables us to call up different parameters on the Displays: -Display C: clicking on the MENU button will call up correlatively the phase voltages (L1, L2, L3), and the line voltages (L12, L23, L31). -Display B: clicking on the MENU button will call up correlatively the ratings of each phase. -Display A: clicking on the MENU button will call up the transmitter's' parameters. The parameter being displayed will light up the LED located on the side of the display. • Pressing the MENU button for 1 second will access the MENU for maintenance and operational hours. Once in this menu, the different parameters can be called up by clicking on the MENU button. The parameters that can be displayed are: -HtS: Hours to the next service. -ttS: Time till the next service (in days). -EnH: Running hours of engine. • Pressing the MENU button for 3 seconds will access programming MENU; the abbreviation PGM are shown on Display C. Once in the programming menu, the variable displayed can be changed by clicking on the MENU button. *See section 3 PROGRAMMING OF VARIABLES.
	The RUN button is used to start the engine. Pressed once, and the engine will start immediately, unless it is fitted with glow plugs, in which case starting may be delayed for up to 6 seconds.
	The STOP button is used to stop the engine. If pressed twice, it will go into Stand-by mode.
	This button has 2 functions: -LAMP TEST function: when pressed, the button will initiate a test of all of the panel's LEDs; this lets us know if all of the LEDs are working or which ones are burned out. -UP function: this function comes into play when navigating in the programming MENU, and is to raise the setting of a defined variable.
	This button has 2 functions: -ALARM MUTE function: if this button is pressed, it will mute the acoustic alarm bell installed for the alarms (it may or may not have a bell installed). -DOWN function: this function is used when in the programming MENU, and is there to reduce the setting of a defined variable.

2.3. Remote panel MDM

This controlled unit permits start and stop the genset manually using the key switch ("RUN" and "OFF" positions) and pushbuttons on the front panel (crank and preheat buttons).

When the engine is running, the unit monitors fault conditions and shuts-down the genset automatically if an alarm occurs. The alarms are indicated with LEDs:

- Overspeed (SPEED)
- Underspeed (SPEED)
- High engine temperature (TEMP)
- Low oil pressure (OIL)
- Auxiliary shutdown (AUX)
- Charge (CHARGE)

3. ELECTRICAL CONNECTIONS (Inputs and outputs)

WARNING: THE UNIT IS FITTED WITH FUSES
It uses external fuses for:
Normal Phase Lines: R-S-T
Generator Phases: U-V-W
Battery Positive: BAT (+)
Install the fuses as close to the unit as possible, in an area granting easy access.
The fuse must be rated at 5 Amps.

WARNING: ELECTRICITY CAN KILL
ALWAYS disconnect power supply prior to connecting the unit.

1) **ALWAYS remove the connectors with a screwdriver when inserting cables.**
2) **ALWAYS check up on the local wiring regulations when carrying out installation.**
3) **An easily accessible disconnection (switching) set-up, e.g.: automatic fuses MUST be included as part of the installation.**
4) **The switching device must NOT be installed using flexible cord.**
5) **The regular power supply MUST incorporate suitable protection against short-circuits (e.g.; thermo-magnetic trips or fuses) of High switching capacity (HBC, minimum of 1500A).**
6) **Use cables suitable for carrying the current (minimum 0.75 mm^2), and suited to the right temperature range.**

The electrical installation depends on the type of generator purchased. There are four kinds of different connection set-ups according to the specifications of the generating device. The control

panel has 2 relay outputs that are configurable. Depending on the configuration of the relay outputs needed, the following installation set-ups are to be used:

MDA

Characteristics	**Groups**	**Base engines**	**Installation type**	**Panel**
Group only with pre-heat. For ETS type.	G-8M-3X G-8T-3 G-15M-3 G-15T-3 G-6M-15 G-6T-15	MINI-17 MINI-26	**INSTALLATION 0**	**See the table attached**
Group with electrical pump and pre-heat. For ETR type.	G-10M-15 / 18 G-10T-15 / 18 G-15M-15 / 18 G-15T-15 / 18 G-20M-15 / 18 G-20T-15 / 18 G-25M-3 G-25T-3	MINI-33 MINI-44	**INSTALLATION 1**	**See the table attached**
Group only with pre-heat. For ETR type.	G-35M-15 / 18 G-35T-15 / 18 G-51T-15 / 18	MINI-62 MINI-74 SM-105	**INSTALLATION 2**	**See the table attached**
Group WITHOUT electrical pump and NO pre-heat. For ETS type.	G-104T-15 / 18	SDZ-165	**INSTALLATION 3**	**See the table attached**

MODEL ENGINE	MODEL GET SET	50Hz			60Hz	
		3-Phases 400V / 230V	3-Phases 230V	1-Phase 230V	3-Phases 480V / 240V	3-Phases 240V
MINI-17	G-8M-3X G-8T-3	**60938380**	**60938220**	**60938220M**		
MINI-26	G-15M-3 G-15T-3 G-6M-15 G-6T-15	**60939380** **60939380**	**60939220** **60939220**	**60939220M** **60939220M**		
MINI-33	G-10M-15			**60972220M**		
	G-10T-15	**60972380**	**60972220**			
	G-10T-18				**60972380.18**	**60972220.18**
MINI-44	G-15M-15			**60973220M**		
	G-15T-15	**60973380**	**60973220**			
	G-15T-18				**60973380.18**	**60973220.18**
	G-25M-3			**60973220M**		
	G-25T-3	**60973380**	**60973220**			
MINI-62	G-20M-15			**60971220M**		
	G-20T-15	**60971380**	**60971220**			
	G-20T-18				**60971380.18**	**60971220.18**
MINI-74	G-35M-15			**60974220M**		
	G-35T-15	**60974380**	**60974220**			

MODEL ENGINE	MODEL GET SET	50Hz			60Hz	
		3-Phases 400V / 230V	3-Phases 230V	1-Phase 230V	3-Phases 480V / 240V	3-Phases 240V
	G-35T-18				**60974380.18**	**60974220.18**
	G-51T-15	**60975380**	**60975220**			
SM-105	G-51T-18				**60975380.18**	**60975220.18**
	G-71T-15	**60994380.70**				
	G-104T-15	**60994380**	**60994220**			
SDZ-165	G-104T-18				**60994380.18**	**60994220.18**

MDM (Optional)

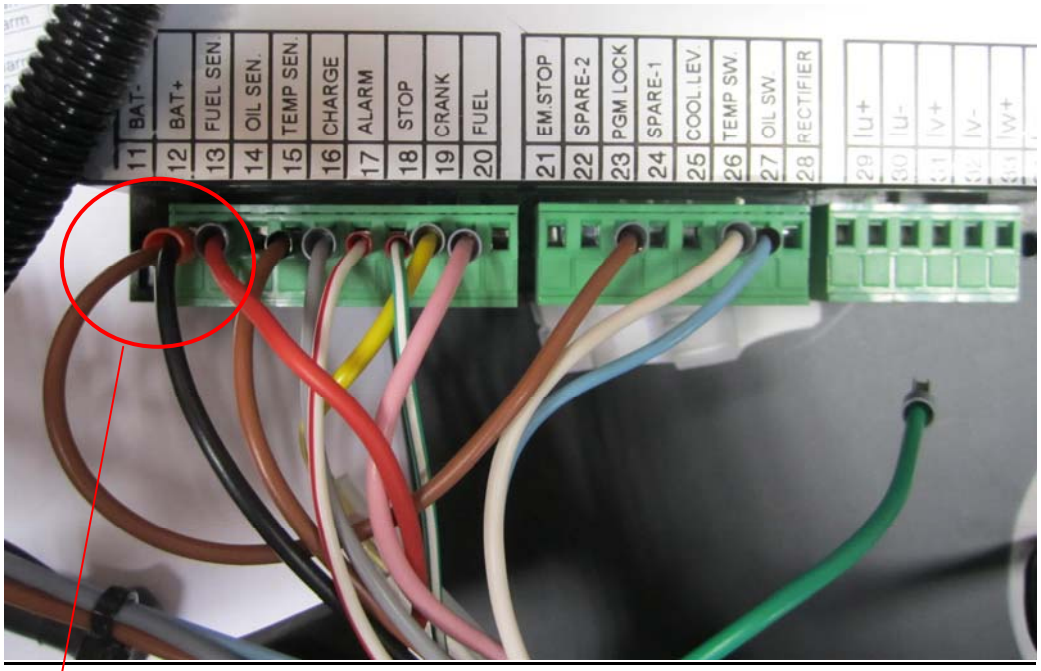
CHARACTERISTICS	GENSETS	INSTALLATION TYPE	PANEL
Type ETS	G-8M-3X G-8T-3 G-15M-3 G-15T-3 G-6M-15 G-6T-15 G-104T-15 / 18	**2nd. PANEL MDM ETS (annexed)**	**60994060**
Type ETR	G-10M-15 / 18 G-10T-15 / 18 G-15M-15 / 18 G-15T-15 / 18 G-20M-15 / 18 G-20T-15 / 18 G-25M-3 G-25T-3 G-35M-15 / 18 G-35T-15 / 18 G-51T-15 / 18	**2nd. PANEL MDM ETS (annexed)**	**60972060**

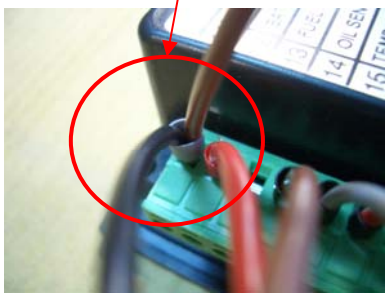
3.1. Installation type 0

This installation pertains to those plant equipped with the base engines MINI-17 and MINI-26. Special characteristics:

- A relay output is needed for the glow plugs, output 17 (green-white cable).
- An output must be configured so that it is enabled when the engine is to be stopped, given that the Stop type is ETS (Energy To Stop), output 18 (yellow cable).
- The green cable is spare.

Installation on the engine side





Detail new connection. Befote in Pos 11 must conect 2 cables and now (from december 2009) the conection cable black and brown is linked.

SUMMARY TABLE

PIN	NOMENCLATURE	DESCRIPTION	CABLE CONNECTION
11	BAT -	Battery negative terminal(earth)	"Black" battery negative lead
12	BAT +	Battery positive terminal	"Red" battery feed lead. **Must be protected with a 5A fuse!!**
13	FUEL SEN.	Fuel sensor	Optional
14	OIL SEN.	Oil sensor	"Brown" lead, oil pressure indicator
15	TEMP SEN.	Temperature sensor	"Grey" cable, water temperature indicator
16	CHARGE	Alternator charge	"White-red" cable charging voltage
17	ALARM	Pre heat	Output relay configured for supplying the glow plugs for 6s. Variable nº 65 of the programming menu configured as 07 "Pre-heat." "Green-white" cable
18	STOP	Stop solenoid coil	"Yellow" cable activates the stop solenoid. Variable nº 65 of the programming menu configured as 03 "Stop."
19	CRANK	Start	"Pink" cable.
20	FUEL	Electrical feed pump	This engine type is fitted with a mechanical pump
21	EM. STOP	Emergency stop	Optional output
22	SPARE-2	Free input	Optional input
23	PGM LOCK		
24	SPARE-1	Free input	Optional input
25	COOL LEVEL	Coolant level sensor	Optional input
26	TEMP. SW.	Temperature contact	Over-range temp. alarm "White" cable
27	OIL SW.	Oil pressure contact	Low oil pressure alarm "Blue" cable.
28	RECTIFIER	Rectifier	Optional

3.2. Installation type 1

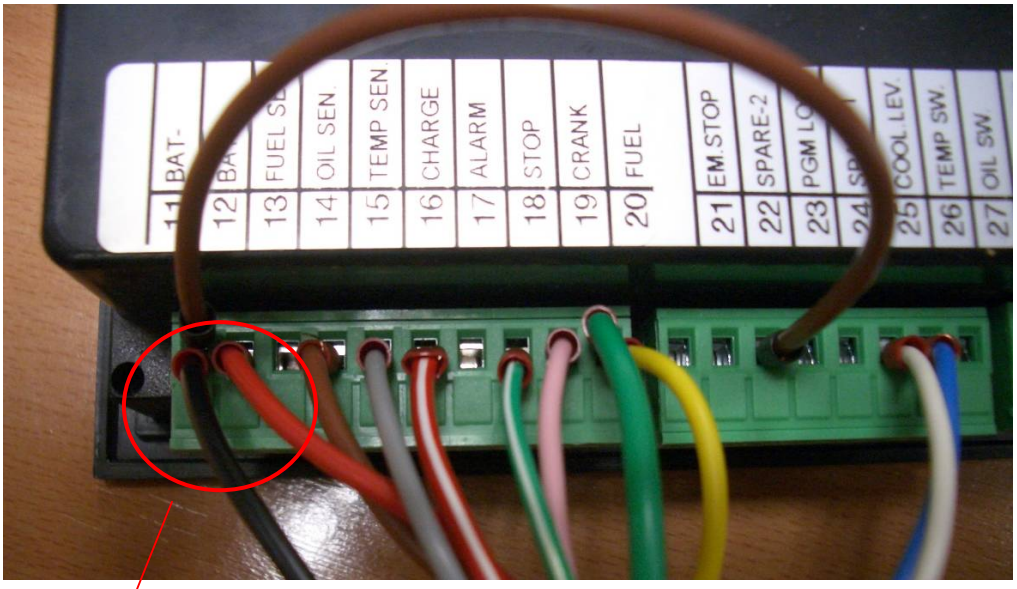
This installation pertains to those plant equipped with the base engines MINI-33 and MINI-44. Special characteristics:

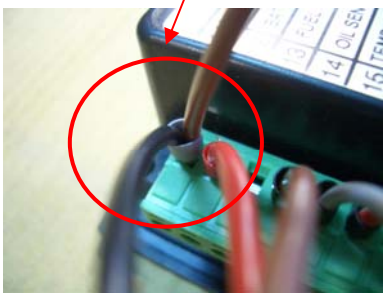
-A relay output is needed for the glow plugs, output 18 (green-white cable).

-A relay output is needed for the electrical feed pump, output 20 (green cable).

-Another output is needed to be activated while the engine is running, given that the stop is an ETR type (Energy To Run); therefore, it must be always on, output 17 (yellow cable).

Installation on the engine side





Detail new connection. Befote in Pos 11 must conect 2 cables and now (from december 2009) the conection cable black and brown is linked.

SUMMARY TABLE

PIN	NOMENCLATURE	DESCRIPTION	CABLE CONNECTION
11	BAT -	Battery negative terminal(earth)	"Black" battery negative lead
12	BAT +	Battery positive terminal	"Red" battery feed lead. **Must be protected with a 5A fuse!!**
13	FUEL SEN.	Fuel sensor	Optional
14	OIL SEN.	Oil sensor	"Brown" lead, oil pressure indicator
15	TEMP SEN.	Temperature sensor	"Grey" cable, water temperature indicator
16	CHARGE	Alternator charge	"White-red" cable charging voltage
17	ALARM	---	---
18	STOP	Pre-heating	Output relay configured for supplying the glow plugs for 6s. Variable nº 65 of the programming menu configured as 07 "Pre-heat." "Green-white" cable.
19	CRANK	Start	"Pink" cable.
20	FUEL + STOP	*Electrical feed pump *Supply for the stop solenoid coil (ETR)	* Green cable for the fuel pump. * Yellow cable to connect the stop solenoid.
21	EM. STOP	Emergency stop	Optional output
22	SPARE-2	Free input	Optional input
23	PGM LOCK		
24	SPARE-1	Free input	Optional input
25	COOL LEVEL	Coolant level sensor	Optional input
26	TEMP. SW.	Temperature contact	Over-range temp. alarm "White" cable
27	OIL SW.	Oil pressure contact	Low oil pressure alarm "Blue" cable.
28	RECTIFIER	Rectifier	Optional

3.3. Installation type 2

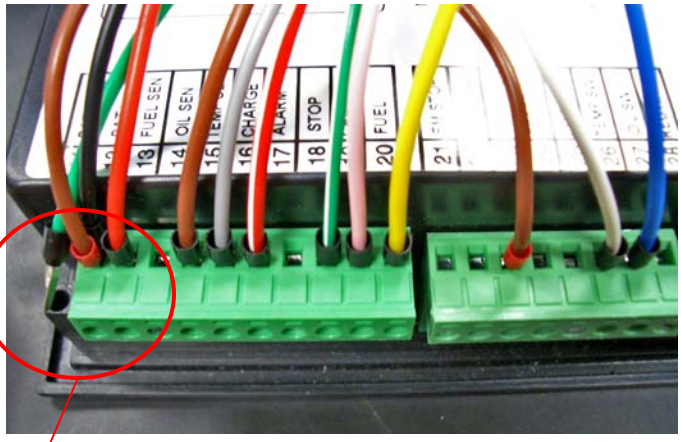
This installation pertains to those plant equipped with the base engines MINI-62, MINI-74 and SM-105. Special characteristics:

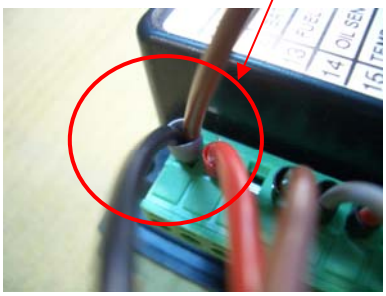
-A relay output is needed that is configured for pre-heater, output 18 (green-white cable).

- Another output is needed to be activated while the engine is running, given that the stop is an ETR type (Energy To Run); therefore, it must be always on, output 20 is taken advantage of for this purpose (yellow cable).

-The green cable of the feed pump is spare.

Installation on the engine side





Detail new connection. Befote in Pos 11 must conect 2 cables and now (from december 2009) the conection cable black and brown is linked.

SUMMARY TABLE

PIN	NOMENCLATURE	DESCRIPTION	CABLE CONNECTION
11	BAT -	Battery negative terminal(earth)	"Black" battery negative lead
12	BAT +	Battery positive terminal	"Red" battery feed lead. **Must be protected with a 5A fuse!!**
13	FUEL SEN.	Fuel sensor	Optional
14	OIL SEN.	Oil sensor	"Brown" lead, oil pressure indicator
15	TEMP SEN.	Temperature sensor	"Grey" cable, water temperature indicator
16	CHARGE	Alternator charge	"White-red" cable charging voltage
17	ALARM	"Free" output	Output free for doing another kind of configuration
18	STOP	Pre-heat	Output relay configured for supplying the glow plugs for 6s. Variable nº 65 of the programming menu configured as 07 "Pre-heat." "Green-white" cable
19	CRANK	Start	"Pink" cable.
20	FUEL	Supply for the stop solenoid coil (ETR)	Output relay configured for supplying the stop coil. "Yellow" cable
21	EM. STOP	Emergency stop	Optional output
22	SPARE-2	Free input	Optional input
23	PGM LOCK		
24	SPARE-1	Free input	Optional input
25	COOL LEVEL	Coolant level sensor	Optional input
26	TEMP. SW.	Temperature contact	Over-range temp. alarm "White" cable
27	OIL SW.	Oil pressure contact	Low oil pressure alarm "Blue" cable.
28	RECTIFIER	Rectifier	Optional

3.4. Installation type 3

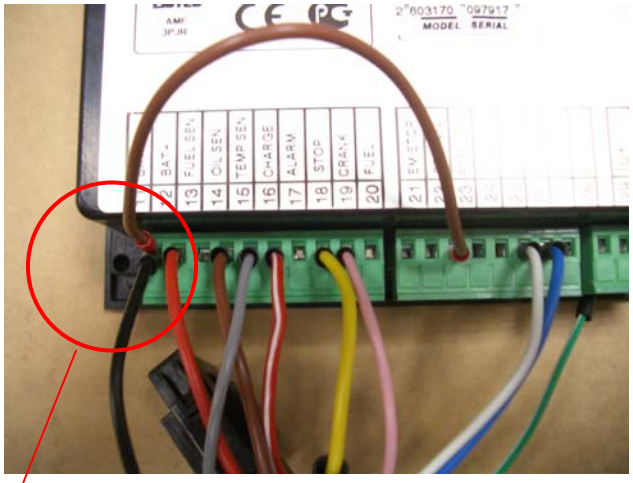
This installation pertains to engine SDZ-165.

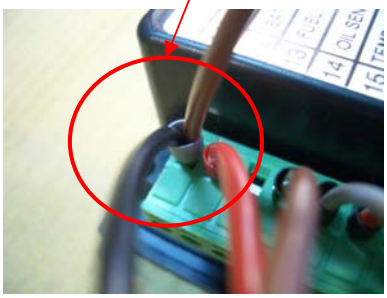
Special characteristics:

-An output must be configured so that it is enabled when the engine is to be stopped, given that the Stop type is ETS (Energy To Stop), output 18 (yellow cable).

-The “green” and “green-white” cables are spare.

Installation on the engine side



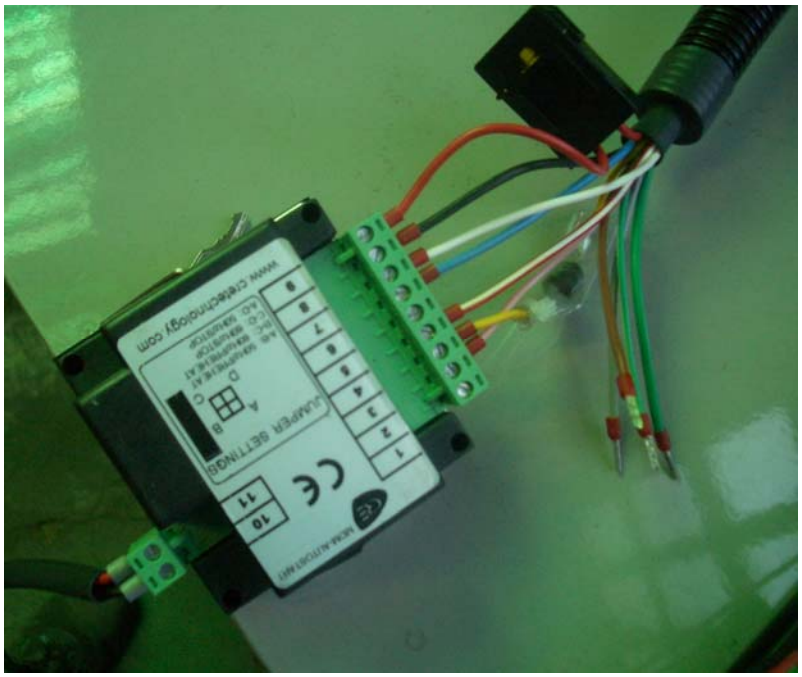


Detail new connection. Befote in Pos 11 must conect 2 cables and now (from december 2009) the conection cable black and brown is linked.

SUMMARY TABLE

PIN	NOMENCLATURE	DESCRIPTION	CABLE CONNECTION
11	BAT -	Battery negative terminal(earth)	"Black" battery negative lead
12	BAT +	Battery positive terminal	"Red" battery feed lead. **Must be protected with a 5A fuse!!**
13	FUEL SEN.	Fuel sensor	Optional
14	OIL SEN.	Oil sensor	"Brown" lead, oil pressure indicator
15	TEMP SEN.	Temperature sensor	"Grey" cable, water temperature indicator
16	CHARGE	Alternator charge	"White-red" cable charging voltage
17	ALARM	Alarm	Optional
18	STOP	Stop solenoid coil	"Yellow" cable activates the stop solenoid. Variable nº 65 of the programming menu configured as 03 "Stop."
19	CRANK	Start	"Pink" cable.
20	FUEL	Electrical feed pump	This engine type is fitted with a mechanical pump
21	EM. STOP	Emergency stop	Optional output
22	SPARE-2	Free input	Optional input
23	PGM LOCK		
24	SPARE-1	Free input	Optional input
25	COOL LEVEL	Coolant level sensor	Optional input
26	TEMP. SW.	Temperature contact	Over-range temp. alarm "White" cable
27	OIL SW.	Oil pressure contact	Low oil pressure alarm "Blue" cable.
28	RECTIFIER	Rectifier	Optional

3.5. Installation type MDM

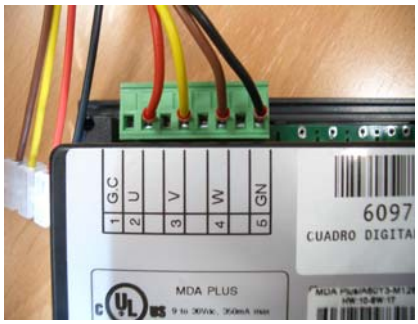


SUMMARY TABLE

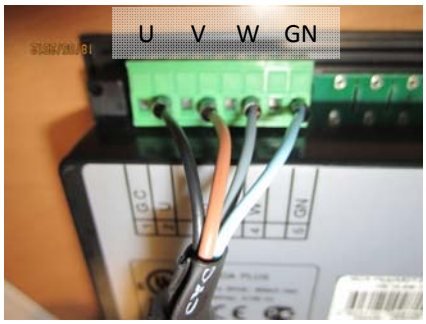
PIN	DESCRIPTION	CABLE CONNECTION ETS	CABLE CONNECTION ETR
1	Fuel		“Yellow” cable
2	Crank	“Pink” cable	“Pink” cable
3	Aux.	“Yellow” cable	“Green” cable
4	Charge alt.	“White-red” cable	“White-red” cable
5	Aux. Shutdown		
6	Low oil pressure switch	“Blue” cable	“Blue” cable
7	High engine temp. Switch	“White” cable	“White” cable
8	Negative	“Black” cable	“Black” cable
9	Battery (must be protected with a 10A fuse)	“Red” cable	“Red” cable
10	L1 alternator (must be protected with a 2A fuse)	“Black” cable	“Black” cable
11	N alternator	“Red” cable	“Red” cable

3.6. Installation of the alternator side

There are two installation colour possibilities; you must check which your type is:



Red/ yellow/ brown/ black wires

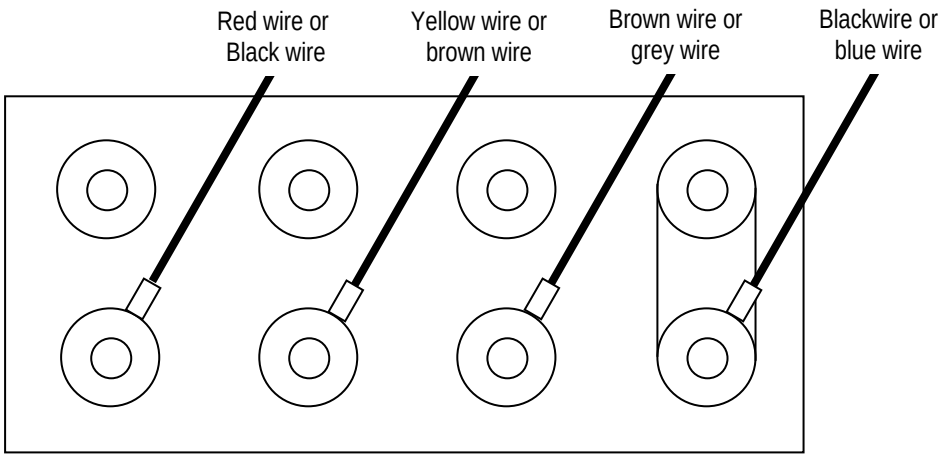


Black/ brown/ grey/ blue wires

- **SUMMARY TABLE**

PIN	NOMENCLATURE	DESCRIPTION	CABLE CONNECTION
2	U	U phase voltage	U phase alternator "Red" cable **Must be protected with a 5A fuse!!**
3	V	V phase voltage	V phase alternator "Yellow" cable **Must be protected with a 5A fuse!!**
4	W	W phase voltage	W phase alternator "Brown" cable **Must be protected with a 5A fuse!!**
5	GND	Earth	Alternator "Black" cable
29	[U]+	Transformer connection for U phase current	Optional *Necessary if wishing to read the settings of rates and power.
30	[U]-		
31	[V]+	Transformer connection for V phase current	Optional * Necessary if wishing to read the settings of rates and power.
32	[V]-		
33	[W]+	Transformer connection for W phase current	Optional * Necessary if wishing to read the settings of rates and power.
34	[W]-		

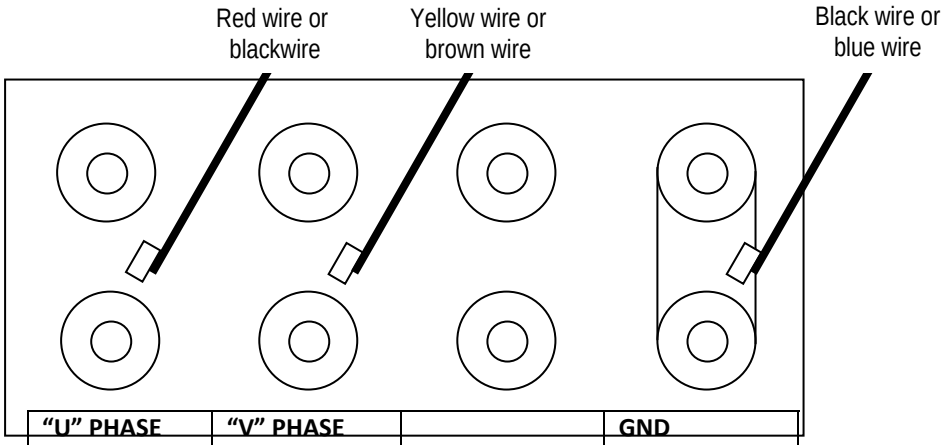
3-PHASES INSTALLATION OF THE ALTERNATOR SIDE



IG

"U" PHASE *Connected to PIN 2 of panel	"V" PHASE *Connected to PIN 3 of panel	"W" PHASE *Connected to PIN 4 of panel	GND *Connected to PIN 5 of panel

1-PHASE INSTALLATION OF THE ALTERNATOR SIDE



"U" PHASE	"V" PHASE		GND
*Connected to PIN 2 of panel	*Connected to PIN 3 of panel		*Connected to PIN 5 of panel

3.7. Type of connectors

There are two options for the alternator side connections in the panel:

- Connection strip: in this case you must install 4 wires from connection strip to alternator terminals according to wire colours.

- Connection through CPC connector (last version)

4. OPERATING MODES

MDA

The plant is started by pressing the **ON** button, and stopped by pressing the **OFF** button. If the **OFF** button is pressed again, the panel will go into standby mode.
If the engine does not start when the **ON** button is pressed, the "*Start fail*" alarm will go off, and if the panel does not stop when the **OFF** button is pressed, the "*Stop fail*" alarm will go off.
It is possible to enable a "password" to allow access to starting (see section 5 PROGRAMMING OF VARIABLES.

MDM

ETR Type (ref. 60972060):

To RUN is necessary to turn to **RUN** key position. Press the preheat button during 6 seconds and, later, press the crank button until the engine is running.
To STOP the genset turn to the **OFF** key position.

ETS Type (ref. 60994060):

To RUN is necessary to turn to **RUN** key position. Press the crank button until the engine is running.

To STOP the genset, press the preheat button during 10 seconds and turn to **OFF** key position.

VERY IMPORTANT:

(1) Never must STOP or RUN from different panels. Always must RUN / STOP from the same panel, main (MDA) or remote (MDM).
(2) To avoid problems if it is not necessary to RUN from the 2nd panel is better take off the key to avoid that the generating Set will be RUNNED from this panel.

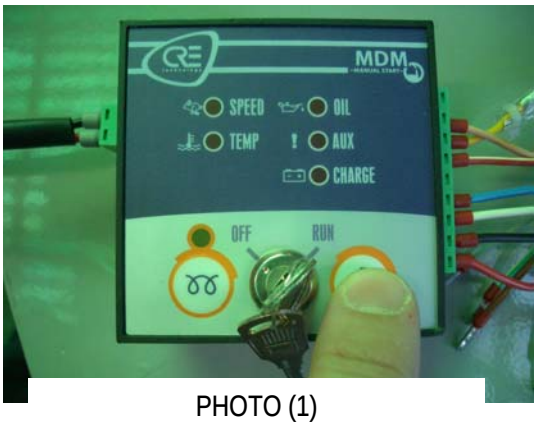


PHOTO (1)
RUN

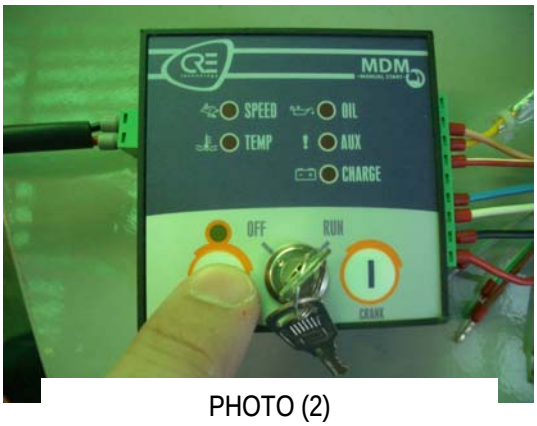


PHOTO (2)
STOP

5. PROGRAMMING OF VARIABLES

The panel comes pre-configured with factory default settings, and making changes to the programming is not recommended. To modify the values, please, contact to Sole Diesel's After-Sales Department.

6. OTHER CHARACTERISTICS

SERVICE REQUIRED LED

The Unit has both hours of engine run-time and time in days as limits of programmable maintenance. The hours of engine running are programmable in intervals of 50 hours (Pgm_044); the time limit is programmable in 1-month intervals (Pgm_045). Should any of these programmed settings be zero, this means that the parameter will not be used. *This is the default configuration of the panels programmed by SOLÉ. It is the responsibility of each client to guarantee the proper maintenance of the engine. In the event of the client wishing to programme the service interval themselves, they can do so by following the steps detailed in section 5.*

When the hours or time limit are up, the LED SERVICE REQUEST will start to flash. To turn this off and reset the service interval, press both the ALARM MUTE and LAMP TEST buttons at the same time and hold them down for 5 seconds. The upper readout will show "SER."

7. TROUBLE SHOOTING

The AC voltages or frequency shown on the Unit are not correct:

-Check the earthing connection of the engine block. It must be solidly connected to earth via an earthing spike.
-The Unit's error margin is +/- 3 volts.
-If the measurements are wrong only when the engine is running, there may be an alternator or voltage regulator failing on the engine. Disconnect the connection of the alternator on the engine and check to see if the error has been removed.
-If the measurements are wrong only when the mains are present, it is possible that the battery charger has failed. Remove the fuse from the charger and check it.

The KW and cos FI readouts fail, but the Amps readouts are correct:

-The current transformers are not connected to their respective inputs or one of the CTs, or they are connected with reverse polarity. Check that the connections of each CT are correct to enable correct KW and cos FI (F.P.) for each corresponding phase. Then reconnect all the CTs.

Short circuit the outputs of the Current transformers not in use.

When RUN button is pressed, the Unit powers up the fuel solenoid, but it does not start and the OIL PRESSURE LED flashes:

The Unit is not getting any battery voltage supply (-) at the oil pressure input.
-The oil pressure sensor is not connected.
-The pressure sensor cable is cut.
-The oil pressure sensor is faulty.
-The oil pressure sensor is taking a long time to close. If the pressure sensor is closed, the Unit will start. It may be necessary to replace the oil pressure sensor.

The engine does not run after the first starting attempt, subsequently, the Unit does not start up and the OIL PRESSURE LED flashes:

-The oil pressure sensor is taking a long time to close shut. Because the Unit senses an oil pressure, it does not start. When the pressure sensor is closed, the Unit will start up. It may be necessary to replace the oil pressure sensor.

When the RUN button is pressed, the engine starts up but then the Unit gives the START FAIL alarm and the engine shuts down:

-The generator's phases are not connected to the Unit. Measure the AC voltage between the terminals U-V-W and the generator's neutral on the rear of the Unit while the engine is running. A fuse protecting the generator's phases may have blown. A connection might not be made. If all is well, remove all the fuses and then replace them one by one, starting with the fuse for the DC feed. Try the Unit again.

The Unit takes a while to carry out the start command:

-The generator's voltage takes a while to rise, or the remanent voltage of the generator is less than 20 Volts. The Unit takes its run speed from the generator's frequency, and needs at least 20 Volts to measure it. If this cannot be avoided, the only solution is to add in an auxiliary relay. The relay's coil must be connected between BATTERY (-) and the terminal D+. The contact of the relay that is usually closed will be connected in series with the START pin of the Unit. The speed will be thus refreshed when terminal D+ is connected to the battery's positive terminal.

The Unit does not work:

Measure the DC feed voltage between terminals 11 and 12 on the rear of the Unit. If all is correct there, remove all fuses and then refit them one by one, starting with the DC supply fuse. Try the Unit again.

Not possible to access programming mode:

The block access to programme input disables access to the programming mode. Disconnect the block access to programme input from the battery's negative terminal prior to making any changes. Do not forget to remake this connection to avoid any unauthorised changes being made.

8. DECLARATION OF CONFORMITY

The Unit complies with the following EU directives:
-73/23/EEC and 93/68/EEC (low voltage)
-89/336/EEC, 92/31/EEC and 93/68/EEC (electro-magnetic compatibility)
Reference regulations:
EN 61010 (safety requirements)
EN 50081-2 (EMC requirements)
EN 50082-2 (EMC requirements)

The CE brand indicates that this product complies with the European requirements regarding environmental safety and consumer protection.

9. TECHNICAL SPECIFICATIONS

MDA

Generator voltage: 15 to 300 V-AC (Phase-N)
Generator frequency: 0-100 Hz.
Power inputs: From the current transformers, .../5A. Maximum load 0.7VA per phase.
Digital inputs: Input voltage 0 - 30 V-DC. Connected internally to the battery's positive terminal via a 4700 Ohm resistor.
Analogue inputs: Resistance input from 0 to 5000 Ohms connected to battery negative terminal. Draws 10 mA when not connected to the battery's negative terminal.
Measuring category: CAT II.
Air category: Level II contamination.
DC supply range: 9.0 V-DC to 30.0 V-DC
Voltage drops for starting: Supports 0V for 100ms.
Standard current drawn: 100 mA-DC.
Maximum current drawn: 350 mA-DC (Activated relay outputs).
CC relay outputs: 10A / 28 V.
Maximum current for each terminal: 10A-RMS.
Alternator excitation trickle current: 54 mA-DC @ 12 V-DC.
Comms port: RS-232. 2400 baud, no parity, 1 stop bit.
Working temperature: -20°C to +70°C (-4 ºF to +158 ºF)
Storage temperature: -40°C to +80°C (-40 ºF to +176 ºF)
Maximum humidity: 95%, non-condensing.
Protection factor: IP65 from the frontal panel; IP30 from the rear section.
Dimensions: 155 x 115 x 48mm. (Width X Height X Depth).
Dimensions of the fitting's opening: 151 x 111mm minimum.
Fitting: Frontal fitting on board, steel retainer on back.
Weight: 310g (approximately.)
Box material: High temperature ABS plastic. Self-extinguishing (UL94-V0, 110 °C).

MDM

Generator voltage: 15 to 300 V-AC (Phase-N)
Generator frequency: 50 or 60 Hz.
Current consumption: 80 mA max. (Outputs open)
Charge fail threshold: 6 V-DC
Charge excitation current: via a 82 ohm resistor connected to the FUEL output.
Inputs:

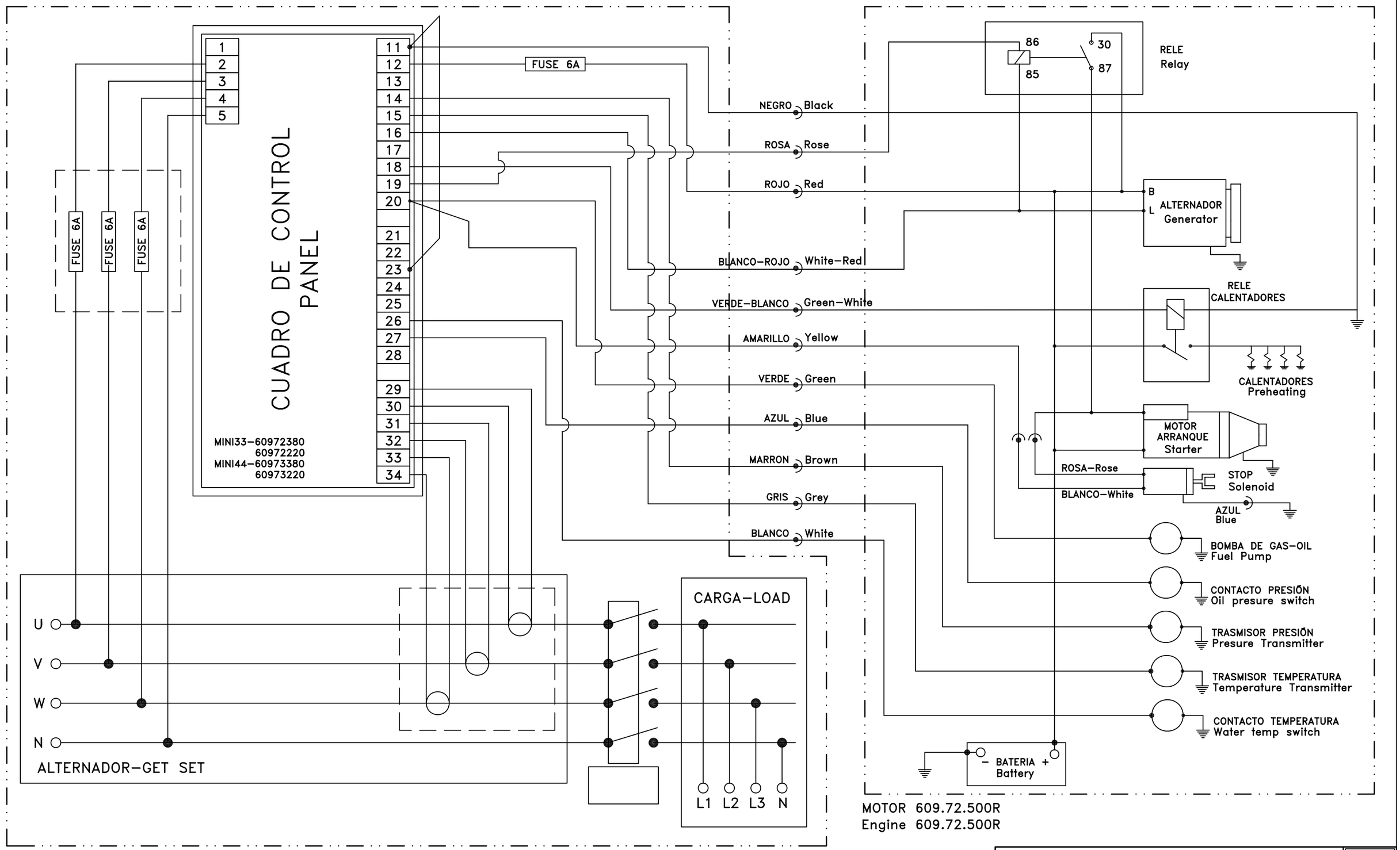
- Overspeed: nominal frequency + 14% (+24% overshoot)
- Underspeed: 25 Hz
- High temperature switch

- Low oil pressure
- Aux: spare fault input. A negative supply connected to this input will cause the engine to be stopped immediately and an alarm to be triggered (independent of the protection hold-off timer)
- Charge: this terminal will supply the excitation current and measure the voltage of the charge alternator.

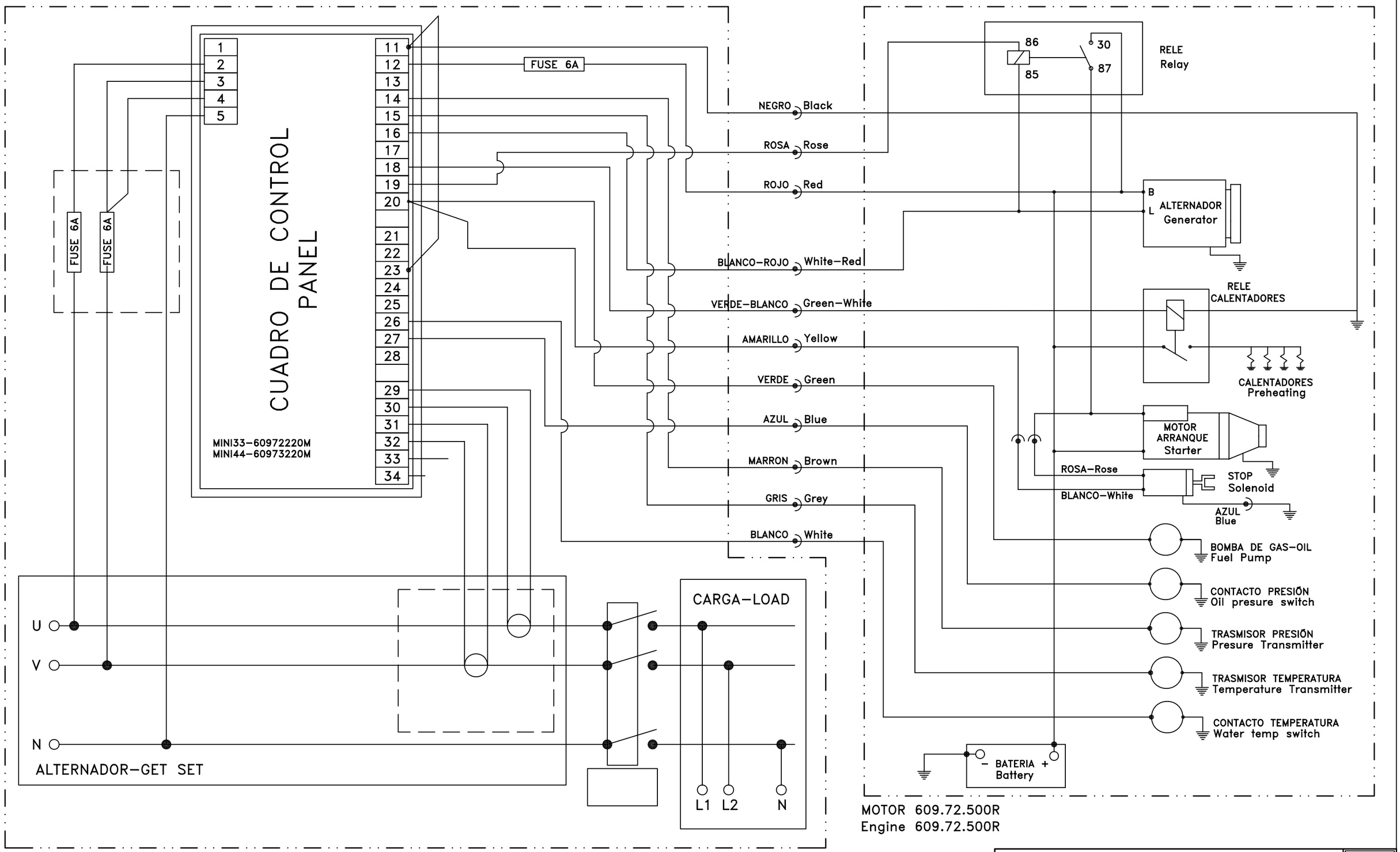
Output:

- Fuel solenoid: 10 A@28 V-DC
- Start: 10 A@28 V-DC
- Auxiliary: 10A@28V-DC

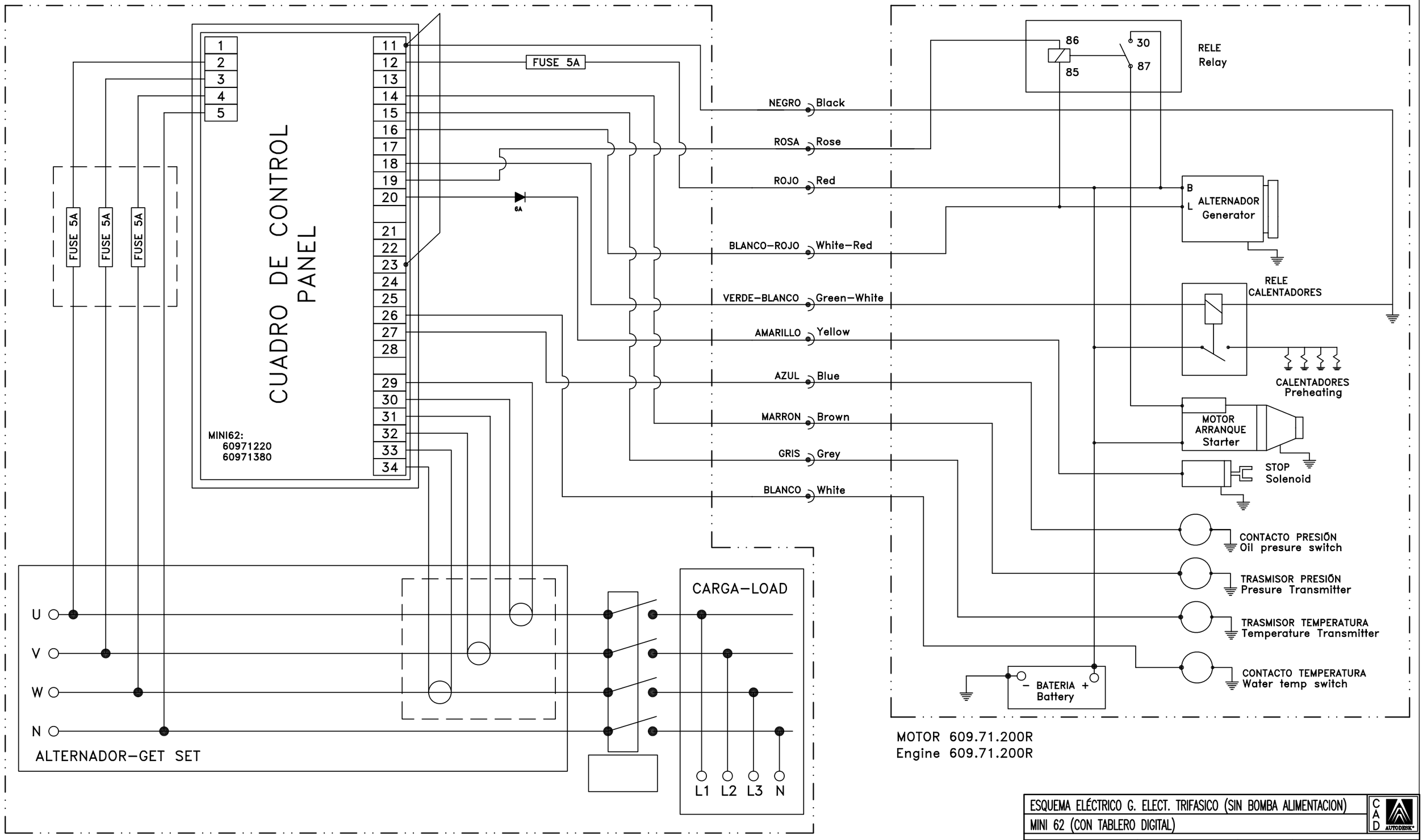
DC supply range: 8-33 V-DC
Working temperature: -20°C to +70°C (-4 ºF to +158 ºF)
Storage temperature: -30°C to +80°C (-22 ºF to +176 ºF)
Maximum humidity: 95%, non-condensing.
Dimensions: 72 x 72 x 38mm. (Width X Height X Depth).
Weight: 140g (approximately).



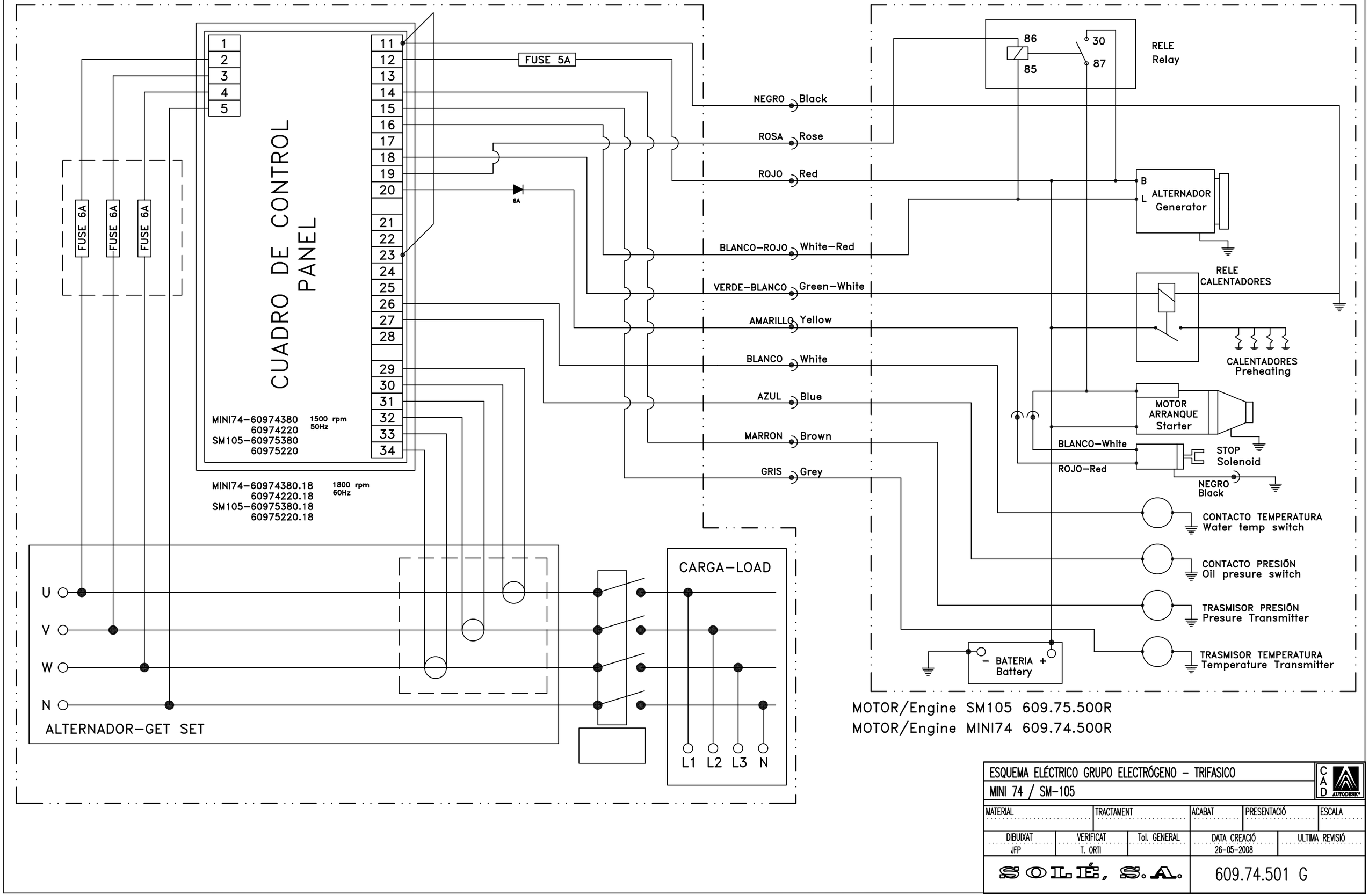
ESQUEMA ELÉCTRICO GRUPO ELECTRÓGENO – TRIFASICO				CAD AUTODESK
MINI 33/44 (CON TABLERO DIGITAL)				
MATERIAL	TRACTAMENT	ACABAT	PRESENTACIÓ	ESCALA
DIBUIXAT: JFP	VERIFICAT: A.ORTI	Tol. GENERAL	DATA CREACIÓ: 20-05-2008	ULTIMA REVISIÓ
SOLÉ, S.A.			60972506 G	



ESQUEMA ELÉCTRICO GRUPO ELECTRÓGENO – MONOFASICO				CAD AUTODESK
MINI 33/44 (CON TABLERO DIGITAL)				
MATERIAL	TRACTAMENT	ACABAT	PRESENTACIÓ	ESCALA
DIBUIXAT: JFP	VERIFICAT: A.ORTI	Tol. GENERAL	DATA CREACIÓ: 20–09–2008	ULTIMA REVISIÓ
SOLÉ, S.A.			60972507 G	



ESQUEMA ELÉCTRICO G. ELECT. TRIFASICO (SIN BOMBA ALIMENTACION)					CAD AUTODESK
MINI 62 (CON TABLERO DIGITAL)					
MATERIAL	TRACTAMENT		ACABAT	PRESENTACIÓ	ESCALA
DIBUIXAT	VERIFICAT	Tol. GENERAL	DATA CREACIÓ		ULTIMA REVISIÓ
JFP	A. ORTI		20-05-2008		
SOLÉ, S.A.			60971502 G		



ESQUEMA ELÉCTRICO GRUPO ELECTRÓGENO – TRIFASICO

MINI 74 / SM-105

MATERIAL	TRACTAMENT	ACABAT	PRESENTACIÓ	ESCALA

DIBUIXAT	VERIFICAT	Tol. GENERAL	DATA CREACIÓ	ULTIMA REVISIÓ
JFP	T. ORTI		26-05-2008	

SOLÉ, S.A.

609.74.501 G

60984220.18 ... Trifasico 240V
60994220 ..... Trifasico 220V
60994380 ..... Trifasico 380V

CUADRO DE CONTROL
PANEL

1 2 3 4 5

11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34

FUSE 5A
FUSE 5A
FUSE 5A

FUSE 7.5A

6A

NEGRO Black
ROSA Rose
ROJO Red
AMARILLO Yellow
AZUL Blue
BLANCO White
BLANCO–ROJO White–Red
MARRON Brown
GRIS Grey

60994200 .... SDZ–165

MOTOR
ENGINE

RELE
Relay
86
85
30
87

6A

ROSA Rose
ROJO Red

B
L
ALTERNADOR
Generator

ROSA Rose
Sobrealimentacion Combustible
Bobinar

MOTOR
ARRANQUE
Starter

STOP
Selenoid

CONTACTO PRESION
Oil presure switch

TRANSMISOR PRESIÓN
Presure Transmitter

TRANSMISOR TEMPERATURA
Temperature Transmitter

– BATERIA +
Battery

U
V
W
N
ALTERNADOR–GET SET

CARGA–LOAD
L1 L2 L3 N

GRUPO ELCTROGENO G104T15/G126T18 – TRIFASICO
ELECTRICAL WIRING, GET SET TYPE G104T15/G126T18

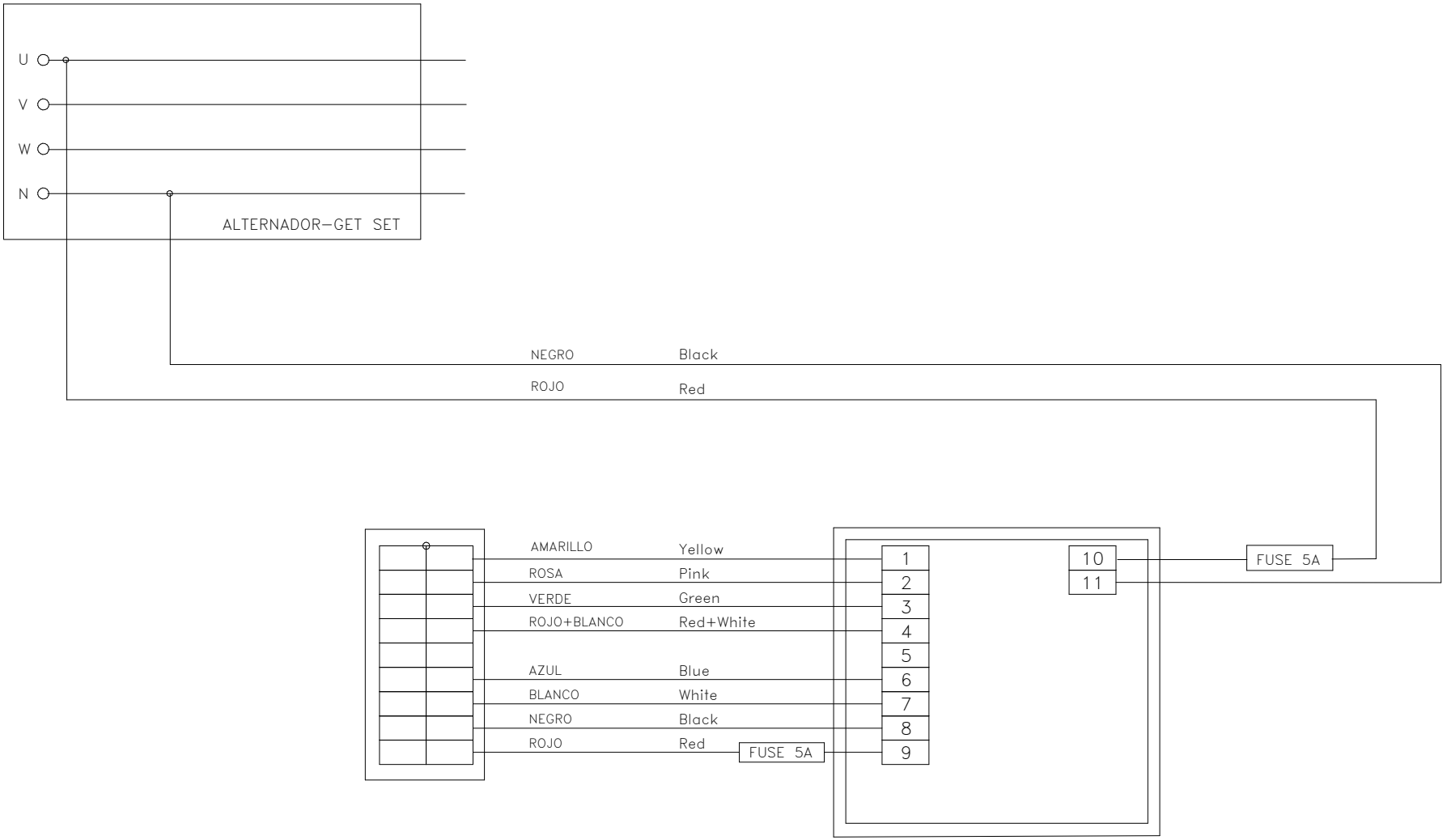
CAD AUTODESK

MATERIAL	TRACTAMENT	ACABAT	PRESENTACIÓ	ESCALA

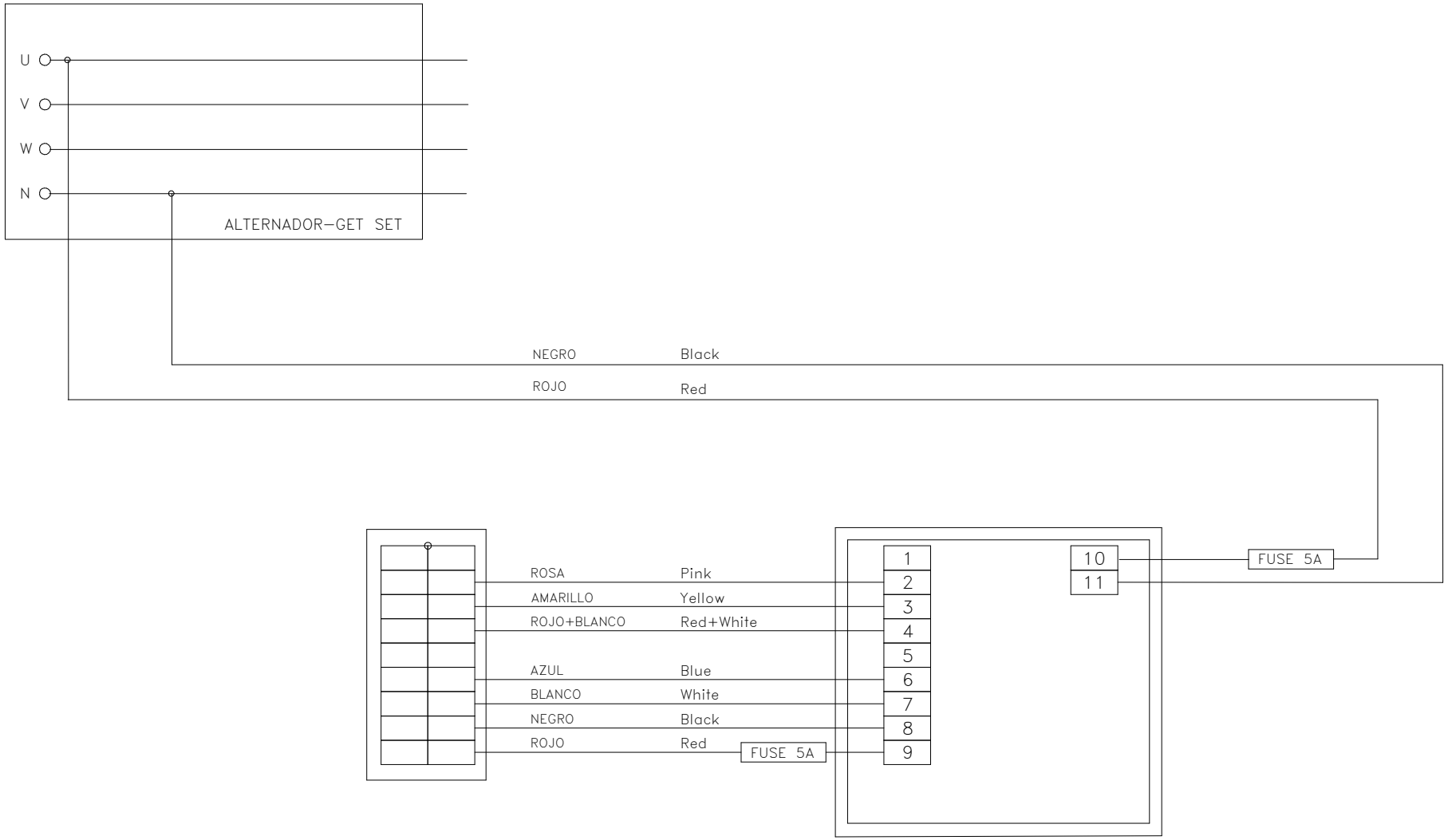
DIBUIXAT	VERIFICAT	Tol. GENERAL	DATA CREACIÓ	ULTIMA REVISIÓ
JAVI	A.ORTI		28–02–2008	

SOLÉ, S.A.

60994501



MODELO PANEL / PANEL MODEL		2nd. PANEL. MDM ETR	
VOLTAGE / VOLTAGE		12 V / 24 V	
DETALLES / DETAILS		ETR STOP SOLENOID	
DIBUJANTE / DRAFTSMAN MONICA SOLE	REVISADO / REVISED VICTOR MIRAVET	FECHA CREACIÓN/CREATION DATE 07-06-2012	FECHA REVISIÓN/REVISION DATE
SOLÉ, S.A.		60972060	



MODELO PANEL / PANEL MODEL		2nd. PANEL. MDM ETS	
VOLTAGE / VOLTAGE		12 V / 24 V	
DETALLES / DETAILS		ETS STOP SOLENOID	
DIBUJANTE / DRAFTSMAN MONICA SOLE	REVISADO / REVISED VICTOR MIRAVET	FECHA CREACIóN/CREATION DATE 07-06-2012	FECHA REVISIóN/REVISION DATE
SOLÉ, S.A.		60994060	

MARINE DIESEL ENGINES
MARINE GET SET

SOLÉ S.A.

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